the names of distinguished men commanding naval expeditions, who themselves, or the officers under them, did a large amount of discovery and good scientific work, are mentioned, however briefly. Yet this is far from being the case. True, some of those expeditions which have been considered unworthy of notice were sent to the far north to gain tidings of the lost expedition under the good and noble but unfortunate Franklin; yet, in addition to doing an immense extent of sledging, by which many hundred miles of *new* coast were traced, they collected much scientific information, little, if any, less valuable than that brought home by the Nares Expedition, whose object was purely scientific.

The names of Kellett, Belcher, and Austin are conspicuous by their absence, except a notice of the officer who acted as second to the latter, and who made a comparatively short sledge journey. We can scarcely suppose that the author was in any way influenced by the fact that he himself sailed in the same vessel under the immediate command of the officer whom he selects for notice, whilst wholly ignoring Admiral Austin, the chief in command.

The names of the Americans, Kane and Hayes, who with very inferior means traced *more* than 300 *miles*[1] of the unknown shores of Smith's Sound, are left out, although each was awarded the gold medal of the Royal Geographical Society—the highest honour that can be bestowed on an explorer—for their Arctic discoveries, as being the most important of the year in which they were made. These are a few examples to prove what has been said.

The author attempts to show that the system of sledging adopted by the Government Naval Expeditions is all but perfect, and that the first long sledge journeys were performed by them. Both these statements admit of question. The sledging arrangements are more or less defective in almost every particular. The tents are bad shelters, far inferior to snow-huts; the sleeping-bags are objectionable, as they prevent transmission of caloric from one individual to the other. The bag itself, being exposed all day to a temperature of perhaps 20° or 30° below zero, is so cold when the occupant gets inside, that all the moisture from the breath, &c., gets condensed upon it, making this bed after a few days' use like "sheet iron" (as remarked by a naval officer who had some unpleasant experience of the fact) and afterwards, when thawed by the extraction of most of the animal heat from the shivering tenant, becomes a veritable "wet blanket." Besides this blanket bag each man before going to rest (?) struggled into what is called a "jumper" made of thick duffle, cold as the other night-gear, thrusting the arms into the sleeves, thus keeping these unfortunate members separated by two folds of a thick non-conductor from the body that owned them, a procedure wholly opposed to both experience and science. To conserve the animal heat the Indian and white *voyageur* either take off their coats or take their arms out of the sleeves when camping out in winter. The Eskimo strips to the waist in his snow hut. It is only the naval Arctic sledge parties that act differently, with very uncomfortable results. The construction of the sledges is very defective for certain conditions of snow when in a semi-packed state—the sledge runners then sink down six or seven inches, and have to be dragged with great difficulty *through* the snow, not *over* it. The dead weight—exclusive of food and fuel—to be hauled on this "admirable system" usually amounted to 85 or 90 lbs. per man, which weight has been reduced under another system to 35 or 40 lbs. per man without loss of efficiency.

"Long-sledge journeys," which Mr. Markham claims to have been initiated by the Government Naval Expeditions, were made at the rate of twenty miles or more a day by civilians, before the "naval system" was put in use, the first occasion of which was by the most experienced of Arctic explorers, Sir James C. Ross, in 1849, when the results were by no means satisfactory, considering the large number of men employed; a small party of five Hudson's Bay men having accomplished more than double the distance at nearly double the daily rate two years before over very difficult ice.

Mr. Markham "formulates three canons," which, he says, "are equally important, as the true methods for future Polar research," but the latter of these, namely, "to reach an advanced position within the unknown area, it is necessary to follow a coast-line trending northwards, *with a western aspect*, is of most interest to the geographical inquirer."

The four words I wish to comment upon are in italics. Had not Mr. Markham given examples of his meaning by mentioning Foxe's Channel and Regent's Inlet, I should have supposed "*western aspect*" a misprint.

It is a curious but certain fact, established by men who have been there, that the shores of all bays and inlets on the northern coast of America, the shores of all inlets and of the great islands lying north of America, having a *western aspect*, are usually ice-blocked, whilst the shores having an *eastern aspect* are comparatively free from ice and navigable. As cases in point Hudson's Bay, Regent's Inlet, Victoria Strait, the shores of Banks Land and Melvile Island, also Smith Sound,[1] are all far more ice-obstructed on the shores having a western than on those having an eastern aspect.[2]

The greater frequency of westerly and north-westerly winds and gales in the western hemisphere in high latitudes are of themselves sufficient to produce the effect I have mentioned, and to form the so-called "ancient ice" in a month or less.

The route by the west shore of Franz-Josef Land is named as favourable for getting far to the north. This may be true, but from the formation of the land it may be considered as by no means safe. The most experienced navigators of these seas state that Franz-Josef Land may perhaps be reached once in every four or five years, as the condition of the ice in Barentz Sea is very uncertain. Supposing this to be true, might not the vessel that was fortunate enough to reach these interesting islands be detained there rather longer than was either safe or agreeable? Already some not unreasonable anxiety is felt for Mr. Leigh Smith in his fine vessel manned by able icemen, who, it is believed, sailed in the direction indicated. Fortunately he is in every respect well provided to face *one* Arctic winter.

That a large quantity of heavy ice is to be generally met with in the Sea of Barentz is not difficult to account for—Spitzbergen on the west, Franz-Josef Land on the north, and Novia Zemblia on the east, form a sort of *cul-de-sac*, into which the floes appear to be drifted about by winds and currents in a most erratic manner.

Mr. Markham states that the "ancient ice" 80 or 100 feet in thickness seen by Nares and other Arctic navigators is the result of "*slow accretions*," meaning, I presume thereby, that these great ice-masses are the gradual growth of a single floe by the freezings of many winters. My opinion is that this thick-ribbed ice is the result of extreme pressure, which has forced one floe over or under the other, as in the case of the upheaval of the Austrian ship with Weyprecht and Payer in 1873-4, of which mention has already been made in the columns of NATURE.

It is doubtful if the extremest cold of an Arctic winter would have any freezing influence on the lower surface of a floe 60 or 80 feet thick, only 9 or 12 feet of which was above water, whilst the remaining 50 or 68 feet were submerged. The known effect of the action of the sea in wasting away the submerged portions of icebergs, even when these are not large, tends to support the theory I suggest.

J. RAE

4, Addison Gardens, W., November 5

A Photographic Experiment with Swan's Incandescent Light

SOME trials I have recently made with Swan's incandescent electric lamps give results that may possibly interest your readers. I employed throughout an electric stream of the same energy—that generated by thirty Grove cells, and as the whole experiment lasted but an hour, it may be assumed, for all practical purposes, that the strength of the current was uniform throughout.

I made use of four lamps in all, supplied promiscuously from Newcastle, their resistances being respectively: No. 1, 67 ohms; No. 2, 59 ohms; No. 3, 58 ohms; No. 4, 52 ohms. My object was to ascertain their actinic power upon a gelatino-bromide film, individually, collectively, and in groups. To do this I exposed a gelatino-bromide film to the action of one light at a distance of 14 feet, the sensitive film being placed behind a screen more or less transparent. The screen was divided into small squares, each representing different thicknesses of fine tissue paper. Thus: square marked No. 1 represented one thickness; No. 2, two thicknesses; No. 3, three thicknesses, and so on;

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[1] This distance (300 miles) of new discoveries is that credited to the Nares Expedition by Mr. Markham.

[1] The author says that Sir G. Nares ascended Smith Sound having a northern trending, but he does not tell us that both on the outward and homeward voyage he kept to the shore having an *eastern aspect*—a fact.

[2] The east coast of Greenland is an exception to this rule, being ice-encumbered by the force of a well known strong current pressing the floes against it.

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the last square being almost opaque, and representing twenty-five thicknesses of tissue paper. The exposure in every case was ten seconds; the distance of the film from one light or lights always 14 feet, and the number of cells 30. The development was confined to two minutes exactly, an oxalate developer of normal strength being employed[1]:—

Result of First Experiment

	No. of square through which the light penetrated.
Group of four lamps (Nos. 1, 2, 3, 4)	13
,, three ,, (Nos. 2, 3, 4)	15
,, two ,, (Nos. 3, 4)	19
,, one lamp (No. 4, low resistance)	23
,, ,, (No. 3, high resistance)	20

As it was a matter of difficulty to judge the exact square or number printed through, the mean results of three observers or readers was taken. So that the development should be the same throughout, all plates were developed simultaneously in the same dish.

The result may not permit us to estimate with scientific accuracy the value of the lights under *the above conditions*, but it proves practically (1) that the amount of light given off by four lamps is less than that given by three, and that the electricity is employed most economically for lighting when only one lamp is used; and (2) that, at any rate in the conditions described, a comparatively low-resistance lamp gives more light than a comparatively high one.

In my second experiment I estimated the actinic power of single lamps, when one or more were in circuit, the photographic arrangements being the same.

Result of Second Experiment

	No. of square through which the light penetrated.
One lamp, No. 4 (only one in circuit)	23
One lamp, No. 4 (two in circuit)	18
One lamp, No. 4 (three in circuit)	14
One lamp, No. 4 (four in circuit)	9
Arc light (with 30 cells) ... ... upwards of	25
Ordinary fish-tail burner (burning 5 cubic feet per hour)	7

The result here is interesting in showing the comparative strength of the lamps by themselves, and to what extent the light, so to speak, is "turned down" by bringing another lamp into circuit. As my screen was only graduated as far as 25, it was impossible to estimate the comparative value of the arc light, for it went above this degree, while a low-resistance Swan lamp only goes as far as 23. This last lamp, No. 4 in the series, was the one always tested, and therefore the results shown may be considered the most favourable. The result given by a good fish-tail burner permits us to make some comparison between gas and the Swan light at a minimum.

It says something for the skill with which the sensitive gelatino-bromide is prepared commercially nowadays, when we find it is so uniformly sensitive that in the two trials (where square 23 is recorded) there should be so unanimous a result.

November 12 H. BADEN PRITCHARD

Sound-producing Ants

REFERRING to Mr. Blanford's letter in NATURE, vol. xxv. p. 32; whilst lying awake early one morning before the servants were stirring, when camped in the Deccan at the present small station of Chota or Chick-Soogoor, on the G.I.P. Railway, during the winter of 1868-69, I heard a sound, as Mr. Blanford suggests, repeated at regular intervals of about a second. It sounded as though the wall of the tent was being struck by a light fringe along one side; but noticing that the air was perfectly still, I listened for some minutes, wondering what it was and trying to fix the locality. I got out of bed cautiously and looked out; the whole of one side of the tent for a height of two feet was covered with white ants so thickly that at the first glance I thought the wall was covered with a grey-reddish mud to this height. I was trying to make out how the sound could be produced, when it stopped suddenly, the ants evidently having become aware of my presence; they then began to clear off the wall rapidly, and in a few moments it had become white again. They had not attacked the cotton wall. On looking at the ground round the tent I found their runs extending from a tamarind tope, the nearest trees of which were about 50 feet away. The runs were built in the usual way of red Deccan soil, there were great numbers of them, varying in width from the thickness of twine to 2½ inches, often crossing each other diagonally. No doubt the ants had found the tent in the evening, and were prepared to make a morning meal of a portion of it, when I disturbed them on looking out. The impression on my mind at the time was that the whole body of ants struck the tent wall at the same time with their heads, and that it was very extraordinary that they all stopped at once; there were no dropping shots, it was an instantaneous cessation along the whole line. The tent, which was a double one, was at least 30 feet long, and the ants possibly extended round the ends. JOHN FOTHERINGHAM

13, Springfield Road, N.W., November 12

UNIVERSITY COLLEGE, LONDON.—The Calendar will give you all the information you want.

"FIFTY YEARS' WORK OF THE GEOGRAPHICAL SOCIETY."—We believe Mr. Markham's narrative may be ordered through any bookseller. The Polar Observing Station at Lady Franklin Bay was really occupied by a United States party in the past summer, with the intention of carrying on observations for at least a year.

SEALS IN LAKE BAIKAL.—Mr. Edward Fry refers Mr. Keane to Bell's "British Quadrupeds," 2nd edit. p. 248, where he will find that Herr Radde figures and describes the seal of Lake Baikal in his "Reise im Süden von Ost-Siberien"; and to Murray's "Geographical Distribution of Mammals," p. 126. Mr. Thomas Ward sends the following references:—Myer's "Geography, vol. ii. p. 9, edition 1829; Erman's "Travels in Siberia," vol. ii. p. 200 (Cooley's translation); "English Cyclopædia" (Article Baikal). From this last Mr. Ward quotes as follows:—"The existence of the salmon, of the seal, and of a kind of sponge in the fresh water of the Baikal has given rise to many speculations among naturalists. Pallas and Georgi are unable to explain this phenomenon otherwise than on the supposition that the Lake of Baikal at some remote period formed a part of the Northern Ocean, . . . or on another supposition, that these animals were transported into the lake by some excessive inundation of the Lena River, whose sources are not far from its western borders."

HEADS AND HATS

WE have received the following further communications on this subject:—

HAVING last March laid the subject referred to by your correspondents, Messrs. Kesteven and Hyde Clarke, before the Bristol Naturalists' Society in a short paper, I venture to offer a *résumé* of the facts collected by my friend Dr. Beddoe and myself, which seem to justify the conclusion that a diminished size of hat is now required by young men as compared with those used by the same classes twenty to twenty-five years ago. (1) I have from time to time during the last three or four years had my attention called to this alleged change by Mr. R. Castle, hatter and hosier of 1, St. Augustine's Parade, Bristol, who, in proof of it, has frequently shown me hats of small size, such as are now generally required by both gentlemen and servants between the ages of twenty and thirty. He states that these smaller hats, which used to constitute only a small percentage of his stock, now form the bulk of it, whilst those which formerly suited the larger proportion of his customers are now usually required only by the older ones amongst them. Mr. Castle estimates the difference as amounting to at least one whole size, which is equivalent to three-eighths of an inch in circumference, and he has furnished me with typical extracts from his order book to Messrs. Lincoln and Bennett in fuller proof of his assertion. I have arranged and reduced his figures in the accompanying table, and the result does undoubtedly seem to be that the buyers of 1875-80 are taking a hat at least one size smaller than the same *class* (not necessarily the same individuals) used to do twenty to twenty-five years previously. (2) My friend Dr. Beddoe, whose attention I called to the subject last year, informed me that Mr. C. Garlick, hat manufacturer of 87, Castle Street, Bristol, furnished him with the sizes of 200 hats sold by him in 1862, and the average is precisely 7, one of the lots yielding 7·01 and the other 6·99. Two

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[1] Developer:—

Saturated solution of oxalate of potash	3 parts.
Saturated solution of proto-sulphate of iron	1 part.

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